APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,700	09/22/2003	Scott J. F. Zogg	03CR156/KE	9258

7590   08/18/2006

Rockwell Collins, Inc.
Attention: Kyle Eppele
M/S 124-323
400 Collins Rd. NE
Cedar Rapids, IA 52498

EXAMINER
CHASE, SHELLY A

ART UNIT	PAPER NUMBER
2133	

DATE MAILED: 08/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>08 June 2006</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-20</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-20</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

    1.☐ Certified copies of the priority documents have been received.

    2.☐ Certified copies of the priority documents have been received in Application No. _____.

    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   Claims 1 to 20 are presented for examination.

Response to Amendment

2.   The rejection of claims 1,2, 6-8, 12-16 and 20 under 35 USC 102 (b) as being

anticipated by Haller et al. is **maintained**.

3.   The rejection of claims 3-5, 9-11, and 17-19 under 35 USC 103 (a) as being

unpatentable over Haller et al. in view of Zhang et al. is **maintained**.

Response to Arguments

4.   Applicant's arguments filed 6-8-2006 have been fully considered but they are not

persuasive.

5.   In response to the arguments concerning the previously rejected claims the

following comments are made:

Haller the prior art made of record states " in order to overcome this problem,

iterative decoding technique have been developed. Rather than determining

immediately whether received bits are zero or one, the receiver assigns each bit a value

on a multi-level scale representative of the probability that the bit is one. A common

scale, referred to as LLR probability, represents each bit by an integer in the range {-

32,31} (see col. 1, lines 55 to 63). Haller also states Data represented on the multi-level

scale is referred to as "soft data," and iterative decoding is usually soft-in/soft-out, i.e.,

the decoding process receives a sequence of inputs corresponding to probabilities for

the bit values and provides as output corrected probabilities taking into account

constraints of the code (see col. 2, lines 1 to 6). Haller further teaches that a

termination checking procedure is preferable performed after each iteration, and

includes determining a minimal absolute probability value associated with any of the bits

in the packet...(see col. 3, lines 40 to 48). Haller teaches that a control unit decides

when to terminate the decoding process by determining the minimum absolute value of

the LLR probability values L of the bits in the packet (see col. 10, lines 28 to 45).

Applicants representative states Claim 1 recites "a processor configured to

determine an efficient number of iterations for an iterative decoder based on the data

throughput value." Claim 7 recites determining a number of iterations to be performed by

an iterative decoder based on the data throughput value." Claim 13 recites "a processor

configured to determine a data throughput value and determine the number of iterations to

be performed by the iterative decoder based on the data throughput value and further

configured to control the number of iterations performed by the iterative decoder based on

the determination." Applicants asserts that these limitations are not taught or suggested by

Haller.

The examiner disagrees with applicant's representative because Haller teaching

broadly encompasses the claimed invention. Haller teaches using a LLR probability

value to determine the number of iterations for an iterative decoding process. The

examiner would like to point out that one of Haller objectives is to determine the number

of decoding iterations Haller states " **it is a further objective of some aspect of the preset invention to provide an efficient method for determining how many iterations are needed for reliable decoding of a packet.**" The examiner would like to further indicate that the claimed data throughput value is not novel since Haller teaches using a LLR probability value to determine a decoding iteration. Therefore, the examiner concludes that the teachings of Haller anticipate the recited claims limitation. The claims were examined according to the broadest reasonable interpretation and are not patentability distinct over Haller. I.e., Haller and the applicant are attempting to solve the same problem (determining the number of iterations of an iterative decoder using a value) and a "data throughput value" is not novel over a LLR probability value. With regards to the argument that Zhang does not cure the deficiencies noted above with reference to claims 1, 7 and 13, the examiner disagrees with applicants representative for the reasons set fort above.

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2.   Claims **1, 2, 6** to **8, 12** to **16** and **20** are rejected under 35 U.S.C. 102(b) as being

anticipated by Haller et al. (USP 6182261 B1).

Claims **1** and **7**:

Haller teaches an apparatus for iterative decoding of multi-component codes

wherein the number of iteration is determined for reliable decoding. The apparatus

comprising: a frame buffer (102) ("input port") for receiving packets of data that are

digitized (see col. 11, lines 45 to 50). Haller also teaches that the received data are

transformed representing a probability value ("data throughput value") (see col. 8, lines

3 to 5).

Haller teaches that a control unit (116) ("processor") determines when to stop

decoding of packets by determining when the minimum or the maximum number of

iterations has been reached (see col. 12, lines 53 et seq.). Haller further teaches that

each new packet is pass in a continuous process between the first and second

decoders until a minimum number of iterations is reached (see col. 14, lines 55 to 68).

Haller teaches that a CRC device checks for errors and outputs a signal indicating the

termination of the decoding process (see col. 15, lines 40 to 65).

As per claims **2** and **8**, teaches that the frame buffer ("data packet queue")

receives the packet and output the received packet for decoding (see col. 11, lines 45 to

55).

As per claims **6** and **12**, Haller teaches that for each new packet ("input value")

the iteration number is set to zero and during the decoding of the packet the predefined

minimum number of iterations is set accordingly based on achieving sufficient decoding quality (see col. 12, lines 65 et seq.).

Claim **13**:

Haller teaches an apparatus for iterative decoding of multi-component codes in a digital receiver system that receives analog signals. The apparatus comprising: data buffers (62 & 64) ("data packet queue") for receiving packets to be decoded (see 9, lines 10 to 15). Haller also teaches a decoder (68) receiving the data from buffer and decoding the received data (62) (see col. 8, lines 14 to 23).

Haller further teaches that a control unit (88) ("processor") determines the minimal probability value LLR ("data throughput") that is used to decide whether to continue decoding or to stop decoding (see col. 8, lines 60 to 68 and col. 10, lines 29 to 40). Haller teaches that the number of decoding iterations is set according to the number of decoding for achieving sufficient decoding quality (see col. 10, lines 15 to 28).

As per claims **14** and **15**, Haller teaches that at the start of the decoding process counter is set to zero for each new packet that enters the system and a predetermined minimum iteration number is set based on a successful decoding quality as well as if the predetermined minimum number is not reached then the system strives for the maximum number (see col. 12, lines 55 et seq.), interpreted as "determine the number of iterations to be performed each time before the iterative decoder begins to decode"

and "each time before the iterative decoder begins an iteration while decoding a

packet."

As per claim **16**, Haller teaches that the frame buffer ("data packet queue")

receives the packet and output the received packet for decoding (see col. 11, lines 45 to

55).

As per claim **20**, Haller teaches that for each new packet ("input value") the

iteration number is set to zero and during the decoding of the packet the predefined

minimum number of iterations is set accordingly based on achieving sufficient decoding

quality (see col. 12, lines 65 et seq.).

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims **3** to **5, 9** to **11** and **17** to **19** are rejected under 35 U.S.C. 103(a) as being

unpatentable over Haller et al. in view of Zhang et al. (USP 6233709 B1).

As per claims **3** to **5** and **9** to **11**, Haller does not specifically teach that the data

throughput value is the rate at which data packets are received nor teaches that the

determination is made by a reference table and that the table includes a number of

iterations to be performed; however, Zhang in an analogous art teaches an apparatus

for iterative decoding that uses the BER to determine the upper and lower limits for the

number of iterations and that a process or may determine the number of iterations from a lookup table (see col. 3, lines 25 to 65).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of determining the number of decoding iterations of Haller to include using a BER and a lookup table as taught by Zhang since, Zhang teaches that decoding to balanced quality of service (QoS) is best achieved with the use of the BER parameter and the lookup table. This modification would have been obvious because a person of ordinary skill in the art would have been motivated to employ a process for achieving effective decoding by balancing the QoS as taught by Zhang. As to the further limitation of the claims, Zhang teaches that each data frame is process according to the required number of decoding iterations (see col. 4, lines 15 to 40).

As per claims **17** to **19**, the claims recite similar limitations as that of claims 3 to 5 and thus, are rejected under the same rationale applied to claims 3 to 5.

Conclusion

6.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the
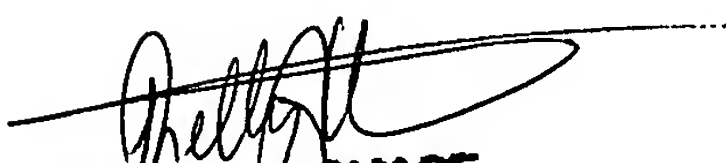
shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

7.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Shelly A. Chase whose telephone number is 571-272-

3816. The examiner can normally be reached on Mon-Thur from 8:00 am to 6:00 pm.

        If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Albert Decady can be reached on 571-272-3819. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

        Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SHELLY CHASE
PRIMARY EXAMINER